Efficient propagation of single cells Accutase-dissociated human embryonic stem cells.

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Authors: Ruchi Bajpai, Jacqueline Lesperance, Min Kim, Alexey V Terskikh

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Public Summary:

Scientific Abstract:
Human embryonic stem cells (hESCs) hold great promise for cell-based therapies and drug screening applications. However, growing and processing large quantities of undifferentiated hESCs is a challenging task. Conventionally, hESCs are passaged as clusters, which can limit their growth efficiency and use in downstream applications. This study demonstrates that hESCs can be passaged as single cells using Accutase, a formulated mixture of digestive enzymes. In contrast to trypsin treatment, Accutase treatment does not significantly affect the viability and proliferation rate of hESC dissociation into single cells. Accutase-dissociated single cells can be separated by FACS and proliferate as fully pluripotent hESCs. An Oct4-eGFP reporter construct engineered into hESCs was used to monitor the pluripotency of hESCs passaged with Accutase. Compared to collagenase-passaged hESCs, Accutase-treated cultures contained a larger proportion of undifferentiated (Oct4-positive) cells. Additionally, Accutase-passaged undifferentiated hESCs could be grown as monolayers without the need for monitoring and/or selection for quality hESC colonies.